

**CLAIMS**

What is claimed is:

1. A method of obtaining data from a data source and rendering the data to an interface, comprising:

    sending a first request message to a data provider;  
    receiving a first response message from the data provider, the first response message having a schema component and a data component; and  
    rendering data from the data component to the interface according to the schema component.

2. The method of claim 1, wherein the data component includes at least one data record having at least one data element, wherein the schema component includes a name component, a title component, a width component, an alignment component, a display component, and a type component associated with the at least one data element in the at least one data record, and wherein rendering data from the data component to the interface according to the schema component comprises providing a presentation language representation of the at least one data element of the at least one data record to the interface according to the name component, title component, width component, alignment component, display component, and type component associated therewith.

3. The method of claim 1, wherein the first request message includes an origin record identifier and a record count identifier.

4. The method of claim 3, wherein the data component includes at least one data record having at least one data element, wherein the schema component includes a name component, a title component, a width component, an alignment component, a display component, and a type component associated with the at least one data element in the at least one data record, and wherein rendering data from the data component to the interface according to the schema component comprises

providing a presentation language representation of the at least one data element of the at least one data record to the interface according to the name component, title component, width component, alignment component, display component, and type component associated therewith.

5. The method of claim 4, wherein the record count identifier comprises an integer representing a number of records desired from the data source; wherein the data component comprises an integer number of data records having at least one data element, the integer number being equal to the record count identifier; wherein the schema component includes a name component, a title component, a width component, an alignment component, a display component, and a type component associated with the at least one data element in the integer number of data records; and wherein rendering data from the data component to the interface according to the schema component comprises providing a presentation language representation of the at least one data element of the integer number of data records to the interface according to the name component, title component, width component, alignment component, display component, and type component associated therewith.

6. The method of claim 5, wherein the presentation language representation is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.

7. The method of claim 4, wherein the presentation language representation is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.

8. The method of claim 4, wherein the display component has a binary display value and the type component has a binary type value, and wherein providing a presentation language representation of the at least one data element of the at least one data record to the interface according to the name component, title component,

width component, alignment component, display component, and type component associated therewith comprises:

displaying the at least one data element of the at least one data record via the interface if the display value is one;

hiding the at least one data element of the at least one data record if the display value is zero;

displaying the at least one data element of the at least one data record as an image via the interface if the display value is one and the type value is one; and

displaying the at least one data element of the at least one data record as HTML via the interface if the display value is one and the type value is zero.

9. The method of claim 8, further comprising:

sending a subsequent request message to the data provider, the subsequent request message having a record identifier, a record count identifier, and a direction identifier;

receiving a subsequent response message from the data provider, the subsequent response message having a data component; and

rendering data from the data component of the subsequent response message to the interface according to the schema component of the first response message.

10. The method of claim 1, further comprising:

sending a subsequent request message to the data provider, the subsequent request message having a record identifier and a record count identifier;

receiving a subsequent response message from the data provider, the subsequent response message having a data component; and

rendering data from the data component of the subsequent response message to the interface according to the schema component of the first response message.

11. The method of claim 10, wherein the subsequent request message further includes a direction identifier.

12. The method of claim 10, wherein the data component of the subsequent response message includes at least one data record having at least one data element, wherein the schema component of the first response message includes a name component, a title component, a width component, an alignment component, a display component, and a type component associated with the at least one data element in the at least one data record, and wherein rendering data from the data component of the subsequent response message to the interface according to the schema component of the first response message comprises displaying the at least one data element of the at least one data record via the interface according to the name component, title component, width component, alignment component, display component, and type component associated therewith.

13. The method of claim 10, wherein the data component of the subsequent response message is empty and wherein the subsequent response message further comprises an error component including error information, further comprising creating an error event according to the error component.

14. The method of claim 13, wherein creating an error event according to the error component comprises rendering a presentation language representation of at least a portion of the error information from the error component to the interface.

15. The method of claim 14, wherein the presentation language representation of the at least a portion of the error information is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.

16. The method of claim 9, wherein the data component of the subsequent response message is empty and wherein the subsequent response message further comprises an error component including error information, further comprising creating an error event according to the error component.

17. The method of claim 16, wherein creating an error event according to the error component comprises rendering a presentation language representation of at least a portion of the error information from the error component to the interface.

18. The method of claim 17, wherein the presentation language representation of the at least a portion of the error information is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.

19. The method of claim 3, wherein the data component is empty and wherein rendering data from the data component to the interface according to the schema component comprises rendering one of an end of form indicia and a beginning of form indicia to the interface.

20. The method of claim 3, further comprising constructing the first request message according to a user action in the interface.

21. A method of providing data from a data source to a data consumer, comprising:

receiving a first request message from the data consumer;  
constructing a first response message having a schema component and a data component with data from the data source according to the first request message; and  
sending the first response message to the data consumer.

22. The method of claim 21, wherein the first request message includes an origin record identifier, and a record count identifier, wherein constructing the first response message comprises constructing the first response message having a schema component and a data component with data from the data source according to the origin record identifier and the record count identifier.

23. The method of claim 22, wherein constructing the first response message comprises:

constructing a query string according to the origin record identifier and the record count identifier;

performing a query of the data source according to the query string;

obtaining a result set from the data source according to the query; and

constructing the first response message according to the result set.

24. The method of claim 23, wherein the first response message further includes an error component and wherein constructing the first response message further comprises determining whether an error condition exists according to the result set and constructing the error component having error information if an error condition exists.

25. The method of claim 23, wherein constructing the first response message according to the result set comprises:

constructing the data component having at least one data record from the result set with at least one data element associated therewith; and

constructing the schema component having a name component, a title component, a width component, an alignment component, a display component, and a type component associated with the at least one data element in the at least one data record.

26. The method of claim 23, wherein constructing a first response message comprises:

determining an integer according to the record count identifier;

constructing the data component having a number of data records in the data component equal to the integer if the integer is non-zero;

constructing an empty data component if the integer is zero;

constructing an empty data component and constructing an error component having error information if an error condition exists; and

constructing an empty data component when an end of file or beginning of file condition exists.

27. The method of claim 21, further comprising:  
receiving a subsequent request message from the data consumer, the subsequent request message having a record identifier and a record count identifier;  
constructing a subsequent response message having a data component with data from the data source according to the record identifier and the record count identifier; and  
sending the a subsequent response message to the data consumer.

28. The method of claim 27, wherein the subsequent request message further includes a direction identifier, and wherein constructing the subsequent response message further comprises constructing a subsequent response message having a data component with data from the data source according to the record identifier, the record count identifier, and the direction identifier.

29. The method of claim 27, wherein constructing the subsequent response message comprises:

constructing a subsequent query string according to the record identifier and the record count identifier of the subsequent request message;  
performing a query of the data source according to the subsequent query string;  
obtaining a subsequent result set from the data source according to the query;  
and  
constructing the data component of the subsequent response message according to the subsequent result set.

30. The method of claim 29, wherein constructing the data component of the subsequent response message according to the subsequent result set comprises constructing the data component having at least one data record from the subsequent result set with at least one data element associated therewith.

31. The method of claim 29, further comprising:

constructing an empty data component in the subsequent response message if an error condition exists according to the subsequent result set; and

constructing an error component in the subsequent response message having error information if an error condition exists according to the subsequent result set.

32. The method of claim 29, wherein the record count identifier is an integer and wherein the data component of the subsequent response message comprises an integer number of data records equal to the record count identifier.

33. A system for obtaining data from a data source and presenting the data to an interface comprising:

a data consumer in communication with the interface and adapted to send a first request message to a data provider, the first request message having an origin record identifier, and a record count identifier;

wherein the data provider is adapted to send a first response message to the data consumer, the first response message having a schema component and a data component including data from the data source; and

wherein the data consumer is further adapted to render the data to the interface according to the schema component.

34. The system of claim 33, wherein the data consumer is further adapted to provide a presentation language representation of the data to the interface according to the schema component.

35. The system of claim 34, wherein the presentation language representation is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.



36. The system of claim 33, wherein the data consumer is further adapted to send a subsequent request message, having a record identifier and a record count identifier;

wherein the data provider is further adapted to send a subsequent response message to the data consumer having a subsequent data component including data from the data source; and

wherein the data consumer is further adapted to render data from the subsequent data component of the subsequent response message to the interface according to the schema component of the first response message.

37. The system of claim 36, wherein the data consumer is further adapted to provide a presentation language representation of the data from the subsequent data component according to the schema component.

38. The system of claim 37, wherein the presentation language representation of the data from the subsequent data component is one of HTML, DHTML, postscript, java script, visual basic script, java, and visual C++.

~~39.~~ A data provider for providing data from a data source to a data consumer, comprising:

means for receiving a first request message from the data consumer, the first request message having an origin record identifier and a record count identifier;

means for constructing a first response message having a schema component and a data component according to the origin record identifier and the record count identifier, wherein the data component includes data from the data source; and

means for sending the first response message to the data consumer.

40. The data provider of claim 39, further comprising:

means for receiving a subsequent request message from the data consumer, the subsequent request message having a record identifier and a record count identifier;

means for constructing a subsequent response message having a data component according to the record identifier and the record count identifier of the subsequent request message, wherein the data component of the subsequent response message includes data from the data source; and

means for sending the subsequent response message to the data consumer.

~~41.~~ A data consumer for providing data from a data provider to an interface, comprising:

means for sending an origin request message to the data provider, having an origin record identifier and a record count identifier;

means for receiving a first response message from the data provider, having a schema component and a data component with data from the data source;

means for creating a presentation language representation of the data from the data component according to the schema component; and

means for rendering the presentation language representation of the data to the interface.

42. The data consumer of claim 41, further comprising:

means for sending a subsequent request message to the data provider, having a record identifier and a record count identifier;

means for receiving a subsequent response message from the data provider, having a subsequent data component with data from the data source;

means for creating a presentation language representation of the data from the subsequent data component according to the schema component of the first response message; and

means for rendering the presentation language representation of the data from the subsequent data component to the interface.

~~43.~~ A computer-readable medium having computer-executable instructions for:

sending a first request message to a data provider, the first request message having an origin record identifier, and a record count identifier;

receiving a first response message from the data provider, the first response message having a schema component and a data component with data from a data source; and

rendering data from the data component to an interface according to the schema component.

44. The computer-readable medium of claim 43, further comprising computer-executable instructions for:

sending a subsequent request message to the data provider, the subsequent request message having a record identifier and a record count identifier;

receiving a subsequent response message from the data provider, the subsequent response message having a data component with data from the data source; and

rendering the data from the data component of the subsequent response message to the interface according to the schema component of the first response message.

45. A computer-readable medium having computer-executable instructions for:

receiving a first request message from a data consumer, the first request message having an origin record identifier, and a record count identifier;

constructing a first response message having a schema component and a data component with data from a data source according to the origin record identifier and the record count identifier; and

sending the first response message to the data consumer.

46. The computer-readable medium of claim 45, further comprising computer-executable instructions for:

receiving a subsequent request message from the data consumer, the a subsequent request message having a record identifier and a record count identifier;  
constructing a subsequent response message having a data component with data from the data source according to the record identifier and the record count identifier, and  
sending the a subsequent response message to the data consumer.

~~47.~~ In a data provider, a method for providing data from a data source to a data consumer, comprising:

receiving a first request message from the data consumer, the first request message having an origin record identifier;  
constructing a first response message having a schema component according to the origin record identifier;  
sending the first response message to the data consumer;  
receiving a subsequent request message from the data consumer, the subsequent request message having a record identifier and a record count identifier;  
constructing a subsequent response message having a data component according to the record identifier and the record count identifier of the subsequent request message, wherein the data component of the subsequent response message includes data from the data source; and  
sending the subsequent response message to the data consumer.

~~48.~~ In a data consumer, a method for providing data from a data provider to an interface, comprising:

sending an origin request message to the data provider, having an origin record identifier;  
receiving a first response message from the data provider, having a schema component;  
sending a subsequent request message to the data provider, having a record identifier and a record count identifier;

receiving a subsequent response message from the data provider, having a data component with data from the data source;

creating a presentation language representation of the data from the data component according to the schema component of the first response message; and

rendering the presentation language representation of the data from the data component to the interface.

49. A data provider for providing data from a data source to a data consumer, comprising:

means for receiving a first request message from the data consumer, the first request message having an origin record identifier;

means for constructing a first response message having a schema component according to the origin record identifier;

means for sending the first response message to the data consumer;

means for receiving a subsequent request message from the data consumer, the subsequent request message having a record identifier and a record count identifier;

means for constructing a subsequent response message having a data component according to the record identifier and the record count identifier of the subsequent request message, wherein the data component of the subsequent response message includes data from the data source; and

means for sending the subsequent response message to the data consumer.

50. A data consumer for providing data from a data provider to an interface, comprising:

means for sending an origin request message to the data provider, having an origin record identifier;

means for receiving a first response message from the data provider, having a schema component;

means for sending a subsequent request message to the data provider, having a record identifier and a record count identifier;

means for rendering the presentation language representation of the data from the data component to the interface.

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